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# Chemotaxonomy of the genus *Stemphylium*

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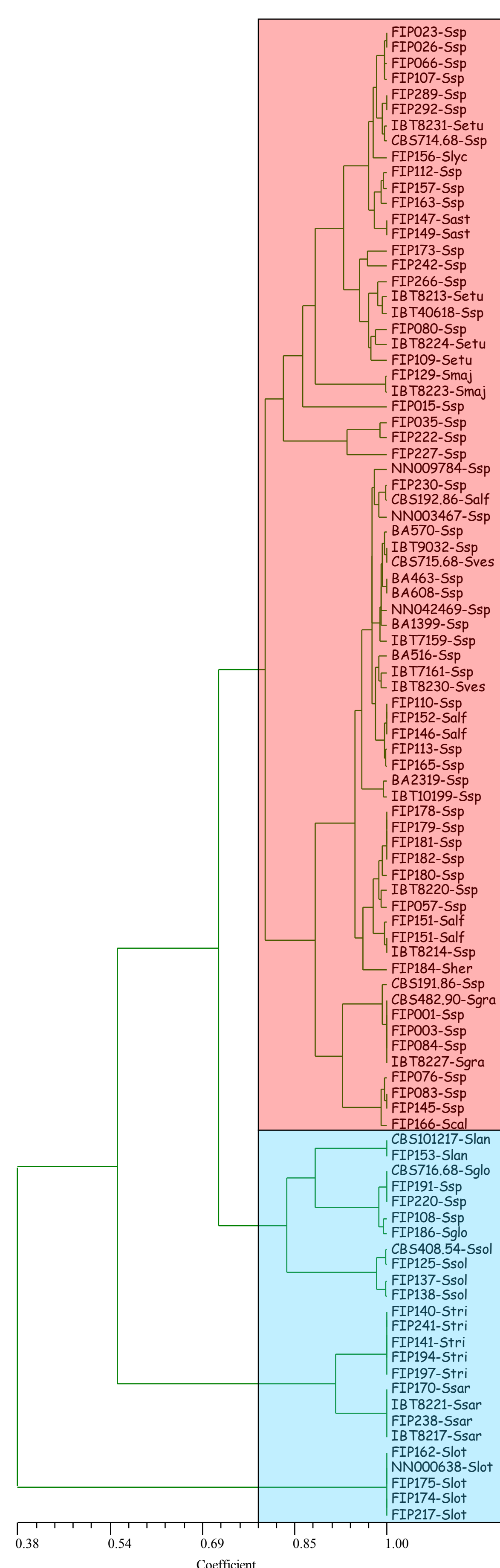
## Abstract

The filamentous fungal genus *Stemphylium* (Anamorphic *Pleospora*) is often found on various crops, and especially the common animal feed plant *Medicago sativa* (alfalfa) is often infected by this plant pathogen. With this in mind it is important to consider what consequences such a contamination can have, e.g. production of mycotoxins. (Firsvad *et al.* (2009))

A clade of *Stemphylium* spp. i.e. *S. herbarum*, *S. alfalfae*, *S. sedicola*, *S. tomatonis* and *S. vesicarium* are troublesome to distinguish as they share both morphological and molecular characteristics. This study has focused on using chemotaxonomy via HPLC-UV/VIS-MS analysis as a third method for identification and to investigate the chemical potential of the genus *Stemphylium*.

A total of 253 unique compounds were used for chemotaxonomy and the majority of these were unknown compounds.

## Chemical identification



### Group C

Chemotaxonomy gave some resolution of group C. Identification via phylogeny would give more resolution but a total of 8 chemical groups were identified. Some were of known isolates e.g. *S. gracilariae*, *S. majusculum* and *S. eturmiunum*.

Interestingly *S. lycopersici* (group A) and *S. callistephi* (group D) clustered within group C.

### Group A, B, D, E, F

All species of this group are very easy to distinguish from group C. These also have solid separation and many unique compounds to differentiate them.

## Morphological identification

The morphology of *Stemphylium* conidia. Some species require special knowledge of the morphology (I-VI) to identify, while others are easier to identify by this method (VII-IX).

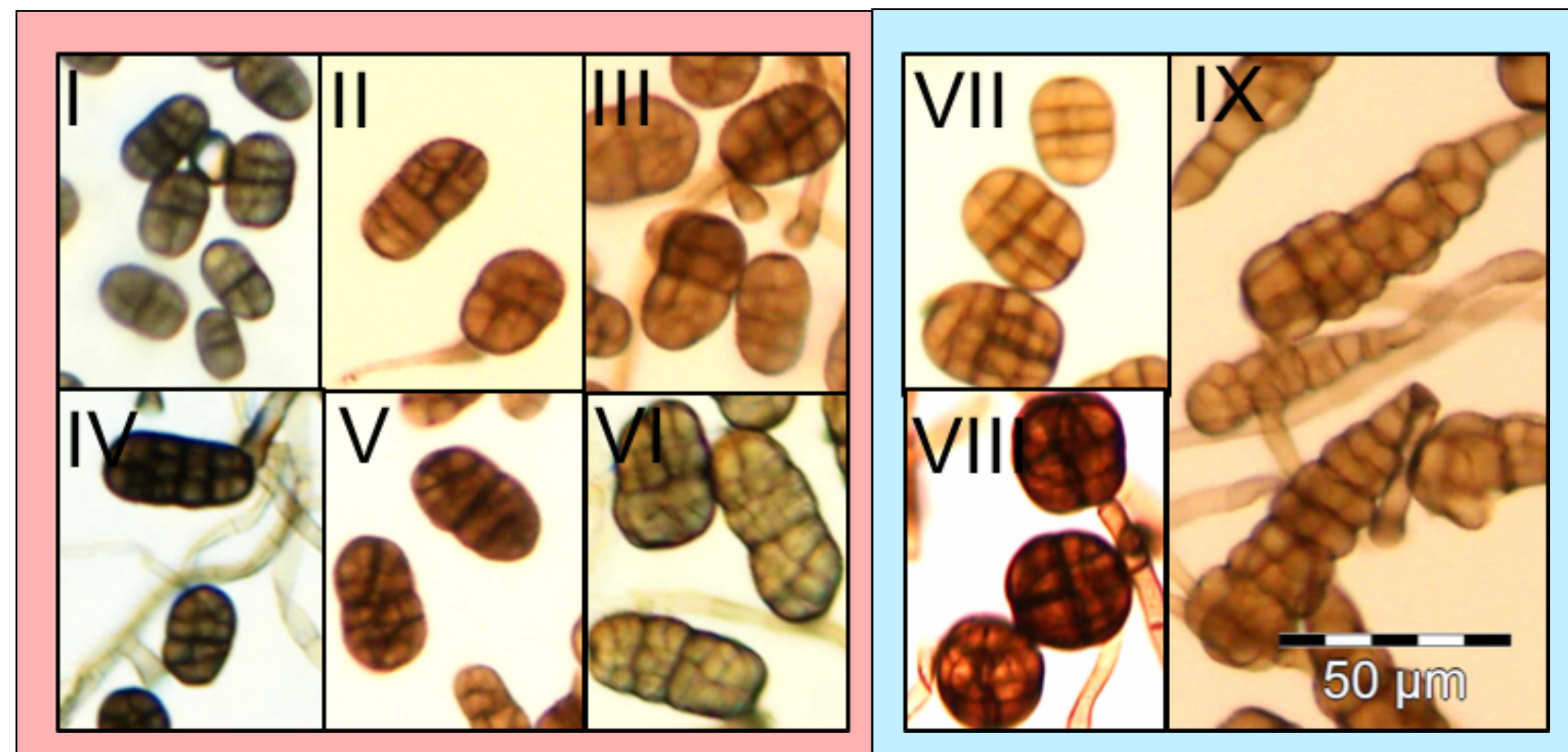
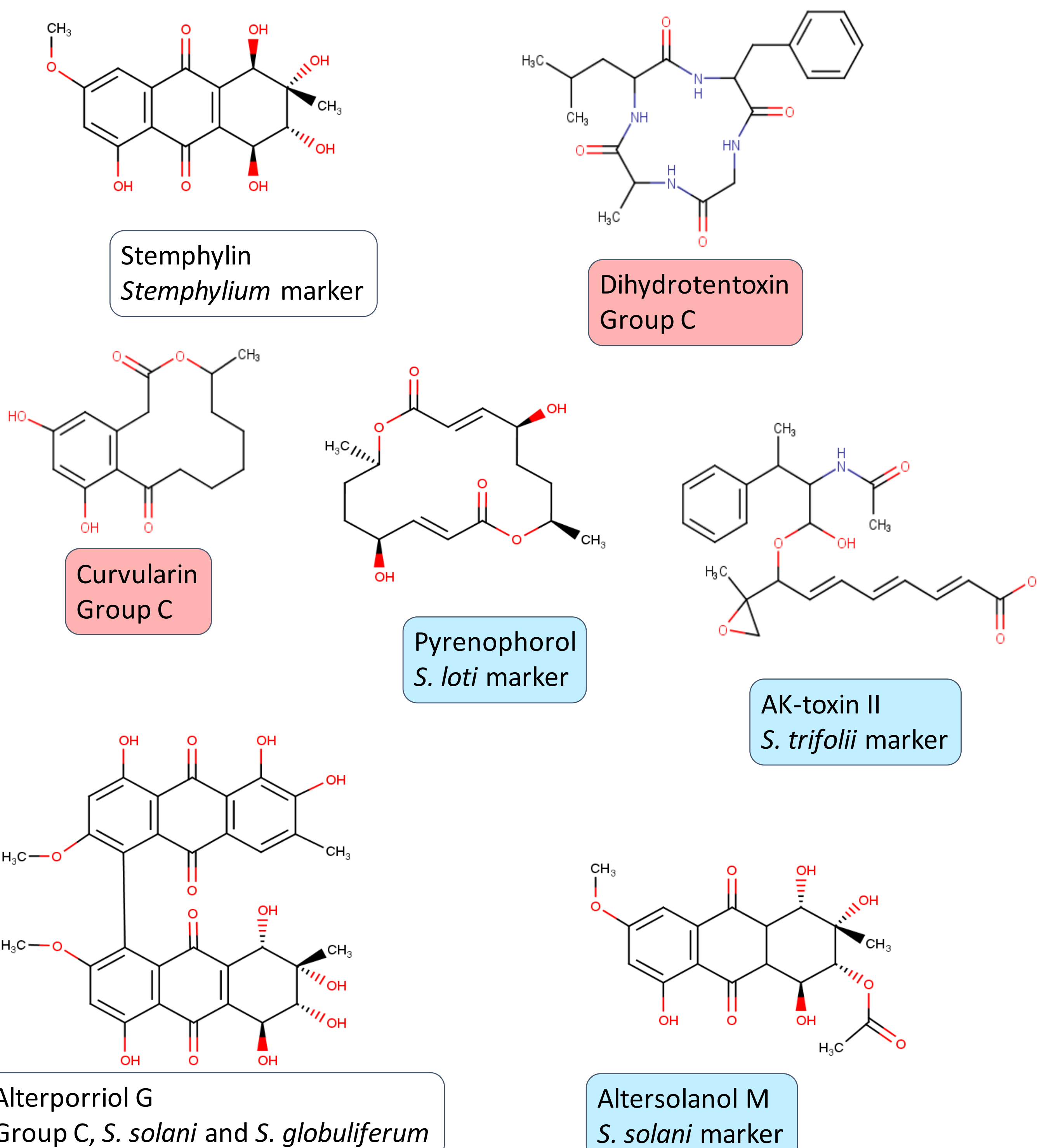


Figure 1. Comparison of micromorphology within the *Stemphylium* genus. I – *S. eturmiunum*, II – *S. herbarum*, III – *S. astragali*, IV – *S. gracilariae*, V – *S. alfalfae*, VI – *S. majusculum*, VII – *S. loti*, VIII – *S. sarciniforme* and IX – *S. lancipes*. Same scale bar for all pictures.

## Examples of compounds

The majority of known *Stemphylium* compounds are of polyketide origin.



## Conclusion and perspectives

Chemotaxonomy with the genus of *Stemphylium* gave a new tool for identification of the individual species. Also, a list of detected compounds within the genus has been made. With this list it is possible to mine for novel bioactivities as it is possible to analyze vastly different metabolic profiles within the same genus.

## References

Firsvad JC, Andersen B, Thrane U. The use of secondary metabolite profiling in chemotaxonomy of filamentous fungi. Mycological research 2008; 112: 231-240